

## **REMARKS**

Applicant respectfully requests reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1-3, 5-11, 13, 14, and 16-38 are pending in the application, with claims 1, 8, 17, 27, and 32 being independent. Claims 4, 12 and 15 are cancelled herein without prejudice to or disclaimer of the subject matter recited therein. Claims 1, 3, 8, 17, 18, 20, 21, 23, 25, 27, 28 and 32 are amended herein. Support for the claim amendments can be found in the original application as filed, at least at pages 10 and 12-21. Accordingly, no new matter has been added.

## **§ 102 REJECTIONS**

Claims 32-33 and 37 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,668,987 (Schneider). Applicant respectfully traverses the rejection.

Nevertheless, without conceding the propriety of the rejection and in the interest of expediting allowance of the application, claim 32 has been amended and is believed to be allowable.

**Independent claim 32** as amended recites:

An inverse query engine having an integrated cache, **the inverse query engine configured to assign a weight value to a filter of the integrated cache based on an estimate of the size of the filter, wherein the weight value denotes the relative size of the filter in relation to other filters of the integrated cache.**

Schneider fails to disclose the features of amended independent claim 32.

Schneider is directed to a database system with subquery optimizer and describes “a subquery cache which can be dynamically adjusted by the system during execution of the query, for achieving an optimal cache size.... From the cache statistics, the system of the present invention can dynamically adjust subquery cache size to an optimal size at execution time based on actual data encountered during execution of the query.”

However, as discussed during the interview, Schneider fails to disclose an “*inverse query engine configured to assign a weight value to a filter of the integrated cache based on an estimate of the size of the filter, wherein the weight value denotes the relative size of the filter in relation to other filters of the integrated cache*”, as recited in amended independent claim 32. Thus, Applicant respectfully submits that as each and every feature is not disclosed, the claims are not anticipated by Schneider. During the interview, the Examiner tentatively agreed that this feature did not appear to be disclosed in the Schneider. Applicant thanks the Examiner for this indication and submits that claim 32 is allowable for at least the foregoing reasons.

**Dependent claims 33 and 37** depend from independent claim 32 and are allowable by virtue of this dependency, as well as for additional features that they recite. Applicant also respectfully requests individual consideration of each dependent claim.

## **§ 103 REJECTIONS**

Claims 1-31, 34-36 and 38 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,668,987 (Schneider) in view of U.S. Patent Application Publication No. 2004/0001498 (Chen). Applicant respectfully traverses the rejection.

Nevertheless, without conceding the propriety of the rejection and in the interest of expediting allowance of the application, claims 4, 12, and 15 are canceled herein thereby rendering the rejection of those claims moot. Also, claims 1, 8, 17 and 27 have been amended as proposed during the interview and are believed to be allowable.

**Independent claim 1** is directed to a method, and recites:

- receiving a request to add a new filter to a filter table stored in an inverse query engine cache;

- adding the new filter to the filter table, wherein the new filter comprises a condition field, a data field, an expiration field, a filter weight field, and **a permanent flag field, the permanent flag field being a Boolean field indicating that the new filter is not to be removed from the filter table during an expire cache operation or a trim cache operation;**

- assigning a weight value in the filter weight field to the new filter based on an estimate of a size of the new filter, wherein the weight value denotes the relative size of the new filter in relation to other filters stored in the filter table of the inverse query engine;**

- determining the filter table of a bounded size;

- maintaining the inverse query engine cache at or below a maximum cache size, wherein the size of the inverse query engine cache may be indicated by size of the filter table, estimate of size of the filter table, or by cache usage;

- wherein the inverse query engine cache comprises a control module, a cache, an add filter module, a remove filter module, a matcher, a maintainer, an expire module, a trim module, a cache weight module, a cache weight, an optimal weight, a maximum weight, a filter table, a most recently used list, and an expiration list;

- wherein the expiration list comprises a filter identifier including an expiration value in the expiration field;

- removing a filter based on an expiration time;

**trimming the filter table upon the occurrence of the filter table reaching the maximum weight, by determining the cache weight and identifying filters to be removed and removing filters from the filter table to obtain the optimal weight; and**

wherein the inverse query engine cache is used exclusively by an inverse query engine to store filters associated therewith.

The cited documents, Schneider and/or Chen, do not disclose or suggest such features.

Schneider is directed to a “data base system with subquery optimizer” and describes “a subquery cache which can be dynamically adjusted by the system during execution of the query, for achieving an optimal cache size.... From the cache statistics, the system of the present invention can dynamically adjust subquery cache size to an optimal size at execution time based on actual data encountered during execution of the query” (Schneider, Abstract).

However, Schneider fails to disclose or suggest “*assigning a weight value in the filter weight field to the new filter based on an estimate of a size of the new filter, wherein the weight value denotes the relative size of the new filter in relation to other filters stored in the filter table of the inverse query engine*”, and a “*trimming the filter table upon the occurrence of the filter table reaching the maximum weight, by determining the cache weight and identifying filters to be removed and removing filters from the filter table to obtain the optimal weight*”, as recited in amended independent claim 1. Additionally, Schneider fails to disclose or suggest “*a permanent flag field, the permanent flag field being a Boolean field indicating that the new filter is not to be removed from the filter table during an expire cache operation or a trim cache operation*”, as recited in amended independent claim 1.

Chen was cited for its alleged teaching that “filters may involve fixed size or variable-size attributes” (Office Action, page 7). However, assuming for the sake of argument that Chen teaches such features, Chen still fails to remedy the deficiencies in Schneider noted above with respect to claim 1. For example, Chen fails to disclose or suggest *“assigning a weight value in the filter weight field to the new filter based on an estimate of a size of the new filter, wherein the weight value denotes the relative size of the new filter in relation to other filters stored in the filter table of the inverse query engine”*, as recited in amended independent claim 1. Further, Chen fails to disclose or suggest *“trimming the filter table upon the occurrence of the filter table reaching the maximum weight, by determining the cache weight and identifying filters to be removed and removing filters from the filter table to obtain the optimal weight”*, as recited in amended independent claim 1. Moreover, Chen fails to disclose or suggest *“a permanent flag field, the permanent flag field being a Boolean field indicating that the new filter is not to be removed from the filter table during an expire cache operation or a trim cache operation”*, as recited in amended independent claim 1.

Thus, Schneider and Chen, whether taken alone or in combination (assuming for the sake of argument that they can be combined), fail to disclose or suggest the features of claim 1. Accordingly, independent claim 1 is allowable over Schneider and Chen.

**Dependent claims 2, 3, and 5-7** depend from independent claim 1 and are allowable by virtue of this dependency, as well as for additional features that they recite. Applicant also respectfully requests individual consideration of each dependent claim.

**Independent claim 8** is directed to system, and recites:

an inverse query engine configured to test an input against a collection of filters;

a cache associated with the inverse query engine, wherein the inverse query engine cache comprises a control module, an add filter module, a remove filter module, a matcher, a maintainer, an expire module, a trim module, a cache weight module, a cache weight, an optimal weight, a maximum weight, a filter table, a most recently used list, and an expiration list;

the filter table stored in the cache and containing multiple filters, wherein the filter comprises a condition field, a data field, an expiration time field, a filter weight field, and a permanent flag field; and

a maintainer configured to maintain a size of the filter table within definite cache bounds, **wherein the trim module of the maintainer, upon the occurrence of the filter table reaching the maximum weight, determines the cache weight and identifies filters to be removed and removes filters from the filter table to obtain the optimal weight;**

wherein the size of the filter table may be indicated by size of the collection of filters or by weight of the collection of filters, **wherein the inverse query engine assigns a weight value in the filter weight field to the filter based on an estimate of the size of the filter, wherein the weight value denotes the relative size of the filter in relation to other filters of the collection of filters stored in the inverse query engine.**

The cited documents, Schneider and/or Chen, do not disclose or suggest such features.

For the reasons discussed during the interview, and similar to those explained above with respect to the rejection of Claim 1, Schneider and/or Chen fail to disclose or suggest all of the features of Claim 8.

Thus, Schneider and/or Chen, whether taken alone or in combination (assuming for the sake of argument that they can be combined), fail to disclose or suggest the features of Claim 8.

**Dependent claims 9-11, 13, 14, and 16** depend from independent claim 8 and thus are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in Claim 8 are not disclosed or suggested by Schneider and/or Chen.

**Independent claim 17** is directed to a computer-readable storage media storing computer-executable instructions, and recites, among other things:

- receiving a request to add a new query to an inverse query engine cache that stores multiple queries;

- assigning a size value to the new query based on cache usage, size of the new query, or estimate of size of the new query, wherein the size value denotes the relative size of the new query in relation to other queries stored in the inverse query engine cache;**

- defining conditions and processing input that satisfies the conditions;

- deriving a cache size that is a sum of query sizes of the queries stored in the inverse query engine;

- determining if the cache size is at greater than or equal to a maximum cache size;

- removing one or more queries from the inverse query engine cache if the cache size is greater than or equal to the maximum cache size, by identifying queries to be removed and removing the one or more queries to obtain an optimal size;**

- deducting the query size of each query removed from the cache size;

- adding the new query to the inverse query engine cache; and

- adding a new query size to the cache size, the new query size identifying a size of the new query added to the inverse query engine cache;

- wherein the inverse query engine cache comprises a control module, a cache, an add filter module, a remove filter module, a matcher, a maintainer, an expire module, a trim module, a cache weight module, the cache size, the optimal size, the maximum cache size, a filter table, a most recently used list, and an expiration list.

The cited documents, Schneider and/or Chen, do not disclose or suggest such features.

For the reasons discussed during the interview, and similar to those explained above with respect to the rejection of Claim 1, Schneider and/or Chen fail to disclose or suggest all of the features of Claim 17.

Thus, Schneider and/or Chen, whether taken alone or in combination (assuming for the sake of argument that they can be combined), fail to disclose or suggest the features of Claim 17.

**Dependent claims 18-26** depend from independent claim 17 and thus are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in Claim 17 are not disclosed or suggested by Schneider and/or Chen.

**Independent claim 27** is directed to method for maintaining an inverse query engine and recites, among other things:

**assigning a weight value in a filter weight field to a filter based on cache usage, size of the filter, or estimate of size of the filter, wherein the weight value denotes the relative size of the filter in relation to other filters stored in a filter table of the inverse query engine;**

determining when inverse query engine cache usage is approaching a cache usage capacity, wherein the cache usage capacity is determined by a weight of a filter table comprising a condition field, a data field, an expiration time field, a filter weight field, and a permanent flag field; and

**removing one or more filters from the inverse query engine cache upon the occurrence of the filter table reaching a maximum weight, by determining the cache weight and identifying filters to be removed and removing filters from the filter table to obtain an optimal weight,**

wherein removing one or more filters comprises at least one of expiring or trimming the cache;

wherein an inverse query engine cache comprises a control module, a cache, an add filter module, a remove filter module, a matcher,



a maintainer, an expire module, a trim module, a cache weight module, the cache weight, the optimal weight, the maximum weight, the filter table, a most recently used list, and an expiration list.

The cited documents, Schneider and/or Chen, do not disclose or suggest such features.

For the reasons discussed during the interview, and similar to those explained above with respect to the rejection of Claim 1, Schneider and/or Chen fail to disclose or suggest all of the features of Claim 27.

Thus, Schneider and/or Chen, whether taken alone or in combination (assuming for the sake of argument that they can be combined), fail to disclose or suggest the features of Claim 27.

**Dependent claims 28-31** depend from independent claim 27 and thus are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in Claim 27 are not disclosed or suggested by Schneider and/or Chen.

**Dependent claims 34-36 and 38** depend from independent claim 32 and therefore are recite all the features of that base claim. As discussed above, Schneider lacks the features of claim 32. Chen was cited for its alleged teaching that “filters may involve fixed size or variable-size attributes” (Office Action, page 7). However, Chen fails to remedy the deficiencies in claim 32 noted above respect to claim 32. For example, Chen fails to disclose or suggest an *“inverse query engine configured to assign a weight value to a filter of the integrated cache based on an estimate of the size of the*

*filter, wherein the weight value denotes the relative size of the filter in relation to other filters of the integrated cache*”, as recited in amended independent claim 32. Thus, claims 34-36 and 38 are allowable over Schneider and Chen, whether taken alone or in combination.

Applicant respectfully submits that the cited references do not render the claimed subject matter obvious and that the claimed subject matter, therefore, patentably distinguishes over the cited references. For all of these reasons, the §103 rejection of these claims should be withdrawn.

### **CONCLUSION**

For at least the foregoing reasons, claims 1-3, 5-11, 13-14, and 16-38 are in condition for allowance. Applicant respectfully requests reconsideration and withdrawal of the rejections and an early notice of allowance.

If any issue remains unresolved that would prevent allowance of this case, **Applicant requests that the Examiner contact the undersigned attorney to resolve the issue.**

Respectfully submitted,

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